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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/107,684	06/30/1998	STEVEN M. BLUMENAU	E0295/7040-R	8390

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EXAMINER

ENCARNACION, YAMIR

ART UNIT

PAPER NUMBER

2187

DATE MAILED: 03/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/107,684

Applicant(s)

BLUMENAU ET AL.

Examiner

Yamir Encarnacion

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 19.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Indicated Allowability

1. The indicated allowability of claims 11 and 21 is withdrawn in view of the newly discovered reference(s) to *Rao* (USPN: 5,920,733) and *Shank* (USPN: 6,145,028). Rejections based on the newly cited reference(s) follow.

35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claim Rejections

4. Claims 1-3, 10, 12-14, 22 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over *Rao* (USPN: 5,920,733).

Claimed	<i>Rao</i>
1. A storage system for use in a computer system including a host computer, the storage system comprising:	See figure 4, the host 250.
at least one storage device having a plurality of user-accessible storage locations, the at least one storage device including at least one disk drive;	See figure 4, the disk 208.
a cache memory; and	See figure 4, the buffers 226 and 228.
a controller, coupled to the cache memory and the at least one storage device, that controls access to the at least one storage device from the host computer,	See figure 4, the scsi controller board 202 and the drive controller board 206.

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<p>the controller being capable of generating data that is independent of any data passed from the host computer to the storage system and writing the generated data to a first <u>user-accessible</u> storage location of the plurality of <u>user-accessible</u> storage locations on the at least one storage device in response to a communication from the host computer that does not include the generated data to be written to the first <u>user-accessible</u> storage location.</p>	<p>The formatting process described on figure 6 meets the limitation of the claim. Also, see column 9, lines 35-41.</p>
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In an alternative embodiment *Rao* suggests implementing a conversion algorithm which converts a file from an IBM compatible Dos format to a Macintosh format and an utility which automatically performs disk error correction within the disk drive assembly. See column 2, lines 20-26 and 4-19. Accordingly, a person of ordinary skill in the art would have found it obvious to implement the conversion algorithm in the drive assembly in light of *Rao*'s own suggestion to do it. The conversion algorithm would have met the limitation of "generating data that is independent of any data passed from the host computer to the storage system and writing the generated data to a first user-accessible storage location of the plurality of user-accessible storage locations on the at least

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one storage device in response to a communication from the host computer that does not include the generated data to be written to the first user-accessible storage location.”

As to claims 2 and 13, the writes performed to the disk would meet the limitation of the claim when the format was converted from PC to MAC. In the alternative, the format command meets the limitation of the claim.

As to claims 3 and 14, the format command involves writing data having a predetermined state.

As to claim 10, see figure 4, the processing circuitry 230.

As to claims 12 and 22, see the comments for claim 1 above.

5. Claims 4-9, 11, 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Rao* as applied to claims 1, 2, 12, 13 and above, and further in view of *Shank* (USPN: 6,145,028).

As to claims 5 and 16, *Rao* does not explicitly disclose that the host computer perceives the storage location to be on different storage devices of the at least one storage device. *Shank* discloses of a system that implements virtual disks by using more than one physical disk. See *Shank*, column 3, lines 37-39. A person of ordinary skill in the art would have been motivated to implement virtual disks such as the ones described by *Shank* in *Rao* for the purpose of creating logical disks that are larger than any single physical disk in the system as suggested by *Shank* in column 3, lines 54-56. Accordingly, it would have been obvious to modify *Rao* so as to implement virtual disks of the type described by *Shank* because the *Rao/Shank* combination would have enabled the creation of logical disks that were larger than any single physical disk in the system.

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The *Rao/Shank* combination would have met the limitation that a plurality of user accessible location were perceived by the host computer to be storage locations on different devices because (a) the virtual disks are stored accross different physical disks (See *Shank*, figure 3) and (b) mapping (such as the one described by *Shank* in step 508 of figure 5) is what enables the host to access the correct physical location in response to a virtual disk request.

As to claims 4 and 15, see the alternative suggested by *Shank* on figure 2. In the alternative, see the comment for claim 5 above. Note that in the interpretation regarding the comments made with respect to claim 5, the “non-contiguous storage locations on the at least one storage device” are the plurality of physical disks on the one logical volume.

As to claims 6 and 17, see the comments for claims 4 and 5 above.

At to claims 7 and 18, in the format command, the range of area to be formatted would have necessarily been identified. In the alternative, the examiner takes “Official notice” that files are often written in a fragmented fashion because there is no single continuous “chunk” of disk space large enough available to hold the file. When a file that is converted from PC format to MAC format is to be written in a fragmented fashion as described above, the areas that the file was to be written to would have necessarily been included as part of the command. As to yet another alternative, when files are written to virtual disks of the type described by *Shank* which can be spread among many physical disks or be made up of non-contiguous portions of a single disk, writing to such virtual disks would have necessarily involved mapping files among the separate non-contiguous areas.

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As to claims 8 and 19, see the comments for claims 4 and 5 above.

As to claims 9 and 20, see the comments for claim 4, 5, and 3 above.

As to claims 11 and 21, see the comments for claim 5 above.

6. Claims 7 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Rao/Shank* as applied to claim 4 and 15 above, and further in view of *Jeffries* (USPN: 5,974,544). The *Rao/Shank* combination does not explicitly describe a single command separately identifying two storage locations.

Jeffries describes "Scatter/Gather" operations on column 6, lines 26-43:

Scatter/Scatter Read/Write Requests

"Scatter" and "gather" refer generally to common techniques in computer architecture: "scatter" is the transfer of a block of information from a contiguous set of locations to a discontinuous set of locations. Gather is the opposite process, ie. collecting information from a discontinuous set of locations for transfer to a contiguous set of locations.

Scatter and gather operations often arise in connection with a transfer of data across a boundary, e.g. from main memory to a peripheral. DMA controllers have included the capability for gather operations, to transfer a block of

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data from scattered locations of main memory out over the bus, or vice versa.

It is also suspected, although not known with certainty, that a Conner IDE drive currently in development allows a single I/O request to access discontinuous regions of the disk.

The above passage at the very least suggests of using a single I/O request to access discontinuous regions on disks. A person of ordinary skill in the art would have found it obvious to implement "scatter/gather" operation like the one's described by *Jeffries* because in doing so the number of commands required to access discontinuous data would have been reduced and improved performance. Accordingly, it would have been obvious to implement "scatter/gather" capabilities of the type described in *Jeffries* into the *Rao/Shank* combination because the *Rao/Shank/Jeffries* combination would have reduced the number of commands required for accessing discontinuous information and would have achieved improved performance.

Response to Arguments

7. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this or an earlier communication from the Examiner should be directed to Yamir Encarnacion by phone at (703) 308-5466.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Do Yoo, can be reached on (703) 308-4908.

Any formal response to this action intended for entry should be mailed to Commissioner of Patents and Trademarks, Washington, D.C. 20231 or faxed to (703) 746-7239 and labeled "FORMAL" or "OFFICIAL." Any informal or draft communication should be faxed to (703) 746-7240 and labeled "INFORMAL" or "UNOFFICIAL" or "DRAFT" or "PROPOSED" and followed by a phone call to the Examiner at the above number. Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Yamir Encarnacion

Patent Examiner

March 1, 2002


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